

REMARKS/ARGUMENTS

Claims 1-31 are active. Minor editorial amendments have been made.

The Applicants thank Examiner Harlan for the courteous and helpful interview of August 5, 2005. The functional properties of products produced by the claimed methods were reviewed. Whether Arendt, U.S. Patent 5,236,987 generally disclosed a genus comprising decyl benzoates for use in plastisols or in paints and whether this document would render the particular benzoates required by the present claims was discussed. It was suggested that the Applicants provide additional experimental data showing that selection of the particular benzoates required by the claims produces superior products and that the Applicants further distinguish the isodecanol Exxal 10 which is shown in Example 3 from the isodecanols used in the present invention.

The Applicants provide herewith a Declaration (and three clean copies of the chromatograms) providing additional Examples of the superior properties, e.g., lower glass transition temperatures, of products produced by the claimed process, as well as a chemical analysis of the Exxal 10 product, which contains at most only 3.6% 2-propyl heptanol.

Rejection—35 U.S.C. §103

Claims 1-24, 26 and 27 were rejected under 35 U.S.C. 103(a) as being unpatentable over Arendt et al. (I), U.S. Patent No. 5,236,987, and Arendt et al. (II), WO 89/00173, in view of Godwin et al., WO 97/39060.

Arendt (I) and (II) and Godwin do not disclose a mixture of:

50 to 99% of 2-propylheptyl benzoate and

from 1 to 50% of at least one decyl benzoate selected from the group consisting of 2-isopropyl-4-methylhexyl benzoate, 2-isopropyl-5-methylhexyl benzoate, 2-propyl-4-methylhexyl benzoate, 2-propyl-5-methylhexyl benzoate, and mixtures thereof.

Arendt (I) discloses “esters of benzoic acid having from about 8 to about 12 carbon atoms” for use in paints and plastisols (see abstract, col. 1, lines 35-37). Examples 2 and 3 disclose the preparation of isodecyl benzoate. However, Arendt is not limited to isodecyl benzoates but discloses many other compounds, see col. 3, lines 6-11. While these compounds are all disclosed for use in paints, there is no disclosure of the particular isodecyl benzoates of the present claims, such as 2-propylheptyl benzoate, 2-isopropyl-4-methylhexyl benzoate, 2-isopropyl-5-methylhexyl benzoate, 2-propyl-4-methylhexyl benzoate, 2-propyl-5-methylhexyl benzoate or mixtures of the isodecyl benzoates. Moreover, there is no suggestion to specifically select these particular types of isodecyl benzoates or any reasonable expectation that use of these particular types of isodecyl benzoates would provide a benefit not shared by the benzoates having 8-12 carbon atoms.

Arendt (II) is directed to benzoates having 10-12 carbon atoms for use in paints and plastisols (see abstract). It too does not disclose the particular isodecyl benzoate mixtures of the invention, or provide any expectation for the benefits discovered by the present inventors.

Godwin discloses C11-C14 benzoates (see abstract), but not C10 benzoates. There is no suggestion or motivation provided by Godwin for the particular mixtures of isodecyl benzoates of the present invention.

There are many different isomers of isodecyl alcohol their esterified products isodecyl benzoates. The claims are directed to isodecyl benzoates with a high concentration of 2-propylheptyl benzoate and have properties that are not shared by the genus of C8-C12 benzoates disclosed by the prior art. For example, the claimed isodecyl benzoates have low glass transition temperatures compared to other isodecyl benzoates and thus provide greater low-temperature flexibilization potential.

Exxal 10 is an example of an isodecyl benzoate that falls outside of the claim language and which is formed predominantly from isodecyl isomers other than 2-

propylheptyl benzoate. Unlike the isodecyl benzoate of the invention, the Exxal 10 benzoate has a very low (3.6% or less) concentration of isodecyl benzoate based on 2-propylheptanol. The Exxal 10 benzoate contains a high concentration of isodecyl benzoates having branching methyl groups (see the specification, page 19, last two lines) and has different physical and functional properties.

On the other hand, the isodecyl benzoates of the invention contain high concentrations of isodecyl benzoate produced from 2-propylheptanol—at least **50%** compared to the **3.6%** or less of the Exxal 10 benzoates. As shown by Example 2 in the specification and by new Examples A and B in the attached Declaration, isodecyl benzoates produced from 98% pure 2-propylheptanol (Example A) or a mixture containing 52% 2-propylheptanol have lower glass transition temperatures than the isodecyl benzoates produced using Exxal 10:

Benzoic acid ester from:	Glass transition temperature (T _g)
90% 2-propylheptanol + 10% 2-propyl-4-methylhexanol (Example 2)	-92°C
Exxal 10 ≤3.6% 2-propyl heptanol; predominantly methyl-branched isodecanol (Comparative Example 3)	-90°C
98% 2-propylheptanol (Declaration, Example A)	-93°C
52% 2-propylheptanol (Declaration, Example B)	-91.3°C

As shown in the table above, selection of isodecyl benzoates produced using the isodecanol mixtures of the invention produce benzoates having superior glass transition temperatures which would confer superior low temperature flexibility on plastics like PVC. Plastics with a lower glass transition temperature remain flexible at a lower temperature. For example, the Space Shuttle Challenger disaster was caused by rubber O-rings that were below

their glass transition temperature on an unusually cold Florida morning, and thus could not flex adequately to form proper seals between sections of of the two solid-fuel boosters.

Since the specific isodecyl benzoate mixtures and their lower glass transition temperatures, which are associated with improved plasticizing properties, are not disclosed or suggested by the prior art, the Applicants respectfully request that this rejection be withdrawn.

Allowable Subject Matter


The Applicants appreciate the indication of allowable subject matter by the Examiner. Claims 23-25 and 28-31 were objected to as depending from rejected claims, but were otherwise indicated as being allowable.

CONCLUSION

In view of the above amendments and remarks, the Applicants respectfully submit that this application is now in condition for allowance. Early notification to that effect is earnestly solicited.

Respectfully submitted,

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